

## SECTION 077200 - ROOF ACCESSORIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Roof curbs.
  - 2. Roof hatches.
  - 3. Preformed flashing sleeves.
  
- B. Related Requirements:
  - 1. Section 055000 "Metal Fabrications" for metal vertical ladders, ships' ladders, and stairs for access to roof hatches.
  - 2. Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.
  - 3. Section 077100 "Roof Specialties" for manufactured fasciae, copings, gravel stops, gutters and downspouts, and counterflashing.
  - 4. Section 077253 "Snow Guards" for snow guards.
  - 5. Section 233423 "HVAC Power Ventilators" for power roof-mounted ventilators.
  - 6. Section 237413 "Packaged, Outdoor, Central-Station Air-Handling Units" for standard curbs specified with rooftop units.

#### 1.2 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
  
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
  
- B. Shop Drawings: For roof accessories.
  - 1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.
  
- C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
  - 1. Size and location of roof accessories specified in this Section.
  - 2. Method of attaching roof accessories to roof or building structure.

3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
4. Required clearances.

B. Sample Warranties: For manufacturer's special warranties.

#### 1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

#### 1.6 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
  - a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
  - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
  - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: 10 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories to withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Wind-Restraint Performance: As indicated on Drawings .

#### 2.2 ROOF CURBS

A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, straight sides, and integrally formed deck-mounting flange at perimeter bottom.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Adaptable Air Products.
2. AES Industries, Inc.
3. Air Balance; a division of MESTEK, Inc.
4. Conn-Fab Sales, Inc.
5. Curbs Plus, Inc.
6. Custom Solution Roof and Metal Products.
7. Greenheck Fan Corporation.
8. KCC International Inc.
9. Kingspan Light + Air, North America.
10. Lloyd Industries, Inc.
11. LMCurbs.
12. Louvers & Dampers, Inc.; a division of Mestek, Inc.
13. Metallic Products Corp.

14. Milcor, Commercial Products Group of Hart & Cooley, Inc.
  15. Pate Company (The).
  16. Plenums Incorporated.
  17. Roof Curb Systems.
  18. Roof Products and Systems (RPS); a division of Hart & Cooley, Inc.
  19. Roof Products, Inc.
  20. Thybar Corporation.
  21. Vent Products Co., Inc.
- C. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- D. Supported Load Capacity: Coordinate load capacity with information on Shop Drawings of equipment to be supported .
- E. Steel: Aluminum-zinc alloy-coated steel sheet, 0.079 inch thick.
1. Finish: Two-coat fluoropolymer .
  2. Color: As selected by Architect from manufacturer's full range .
- F. Construction:
1. Curb Profile: Profile as indicated on Drawings compatible with roofing system.
  2. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
  3. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.
  4. Top Surface: Level top of curb, with roof slope accommodated by sloping deck-mounting flange or by use of leveler frame.
  5. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.
  6. Insulation: Factory insulated with 1-1/2-inch- thick glass-fiber board insulation.
  7. Liner: Same material as curb, of manufacturer's standard thickness and finish.
  8. Nailer: Factory-installed wood nailer along top flange of curb , continuous around curb perimeter.
  9. Wind Restraint Straps and Base Flange Attachment: Provide wind restraint straps, welded strap connectors, and base flange attachment to roof structure at perimeter of curb, of size and spacing required to meet wind uplift requirements.
  10. Platform Cap: Where portion of roof curb is not covered by equipment, provide weathertight platform cap formed from 3/4-inch- thick plywood covered with metal sheet of same type, thickness, and finish as required for curb.
  11. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as curb.

### 2.3 ROOF HATCHES

- A. Roof Hatches: Metal roof-hatch units with lids and insulated single -walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, straight sides, and integrally formed deck-mounting flange at perimeter bottom.
- B. Type and Size:
1. Single-leaf lid, **36 by 36 inches**.
- C. Loads: Minimum **40-lbf/sq. ft.** external live load and **20-lbf/sq. ft.** internal uplift load.

- D. Hatch Material, Steel: Aluminum-zinc alloy-coated steel sheet.
  - 1. Thickness: **Manufacturer's standard thickness for hatch size indicated.**
  - 2. Finish: **Two-coat fluoropolymer.**
  - 3. Color: **White.**
  
- E. Construction:
  - 1. Insulation: **2-inch- thick, polyisocyanurate board.**
    - a. R-Value: **12.0** according to ASTM C1363.
  - 2. Nailer: Factory-installed wood nailer continuous around hatch perimeter.
  - 3. Hatch Lid: Opaque , insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
  - 4. Fabricate curbs to minimum height of **12 inches** above roofing surface unless otherwise indicated.
  - 5. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is **constant.** Equip hatch with water diverter or cricket on side that obstructs water flow.
  
- F. **Non-Penetrating Fall Protection:**
  - 1. **OSHA-compliant fall protection per 29 CFR 1910.29, 29 CFR 1926.501(b) (4) and 29 CFR 1926.502.**
  - 2. **One-piece, welded design.**
  - 3. **Elastomeric tipped compression bolts for tightening against curb of roof hatch.**
  - 4. **Self-closing gate.**
  - 5. **Built-in grab bars.**
  - 6. **Finish: hot dip zinc galvanized and factory finished powder coat paint.**
    - a. **Color: specified by architect.**
  
- G. Hardware: Spring operators, hold-open arm, **stainless** steel spring latch with turn handles, **stainless** steel butt- or pintle-type hinge system, and padlock hasps inside and outside.

## 2.4 PREFORMED FLASHING SLEEVES

- A. Exhaust Vent Flashing: Double-walled metal flashing sleeve or boot, insulation filled, with integral deck flange, **12 inches** high, with removable metal hood and **slotted** metal collar.
  - 1. Metal: Aluminum sheet, **0.063 inch** thick.
  - 2. Diameter: **As indicated on Drawings.**
  - 3. Finish: **Manufacturer's standard.**
  
- B. Vent Stack Flashing: Metal flashing sleeve, uninsulated, with integral deck flange.
  - 1. Metal: **Aluminum sheet, 0.063 inch thick.**
  - 2. Height: **13 inches.**
  - 3. Diameter: **As indicated on Drawings.**
  - 4. Finish: **Manufacturer's standard.**

## 2.5 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 coating designation **and mill phosphatized for field painting where indicated.**
  - 1. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A755/A755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    - a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight.
  
- B. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792/A792M, AZ50 coated.

1. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A755/A755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    - a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight.
  - C. Aluminum Sheet: ASTM B209, manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
    1. Mill Finish: As manufactured.
    2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil.
  - D. Aluminum Extrusions and Tubes: ASTM B221, manufacturer's standard alloy and temper for type of use, finished to match assembly where used; otherwise mill finished.
  - E. Stainless Steel Sheet and Shapes: ASTM A240/A240M or ASTM A666, Type 304.
  - F. Steel Shapes: ASTM A36/A36M, hot-dip galvanized according to ASTM A123/A123M unless otherwise indicated.
  - G. Steel Tube: ASTM A500/A500M, round tube.
  - H. Galvanized-Steel Tube: ASTM A500/A500M, round tube, hot-dip galvanized according to ASTM A123/A123M.
  - I. Steel Pipe: ASTM A53/A53M, galvanized.
- 2.6 MISCELLANEOUS MATERIALS
- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
  - B. Polyisocyanurate Board Insulation: ASTM C1289, thickness and thermal resistivity as indicated.
  - C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, **containing no arsenic or chromium**, and complying with AWPA C2; not less than 1-1/2 inches thick.
  - D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
  - E. Underlayment:
    1. Polyethylene Sheet: 6-mil- thick polyethylene sheet complying with ASTM D4397.
    2. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
  - F. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
    1. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A153/A153M or ASTM F2329.

2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
  3. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
- G. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
- H. Elastomeric Sealant: ASTM C920, elastomeric **polyurethane** polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- I. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.
- J. Asphalt Roofing Cement: ASTM D4586/D4586M, asbestos free, of consistency required for application.

## 2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install roof accessories according to manufacturer's written instructions.
1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
  2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
  3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
  4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of [**uncoated aluminum**] [**stainless steel**] roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
  2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
  3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Roof Curb Installation: Install each roof curb so top surface is level.
- D. Roof-Hatch Installation:
1. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
  2. Attach ladder-assist post according to manufacturer's written instructions.
- E. Preformed Flashing-Sleeve and Flashing-Pipe Portal Installation: Secure flashing sleeve to roof membrane according to flashing-sleeve manufacturer's written instructions; flash sleeve flange to surrounding roof membrane according to roof membrane manufacturer's instructions.
- F. Seal joints with **elastomeric or butyl** sealant as required by roof accessory manufacturer.
- 3.3 REPAIR AND CLEANING
- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A780/A780M.
  - B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting."
  - C. Clean exposed surfaces according to manufacturer's written instructions.
  - D. Clean off excess sealants.
  - E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200